CARLSTADT-EAST RUTHERFORD REGIONAL HIGH SCHOOL DISTRICT
MATHEMATICS DEPARTMENT
SAT MATHEMATICS

SAT Mathematics Curriculum Guide

Pacing Guide **SAT Mathematics is a half year course that meets on a rotating basis for three (3) 55-minute blocks and one (1) 40-minute block for every five (5) day cycle.**	**Unit 1:** Number and Operations , 7 days **Unit 2:** Algebra and Functions, 8 days **Unit 3:** Geometry and Measurements, 7 days **Unit 4:** Statistics, Probability and Data Analysis, 7 days

21st Century Skills Standards: **9.1** Personal Finance Literacy **9.2** Career Awareness	**9.1.12.D.3:** Summarize how investing builds wealth and assists in meeting long-and short-term financial goals. **9.1.12.D.5:** Justify the use of savings and investment options to meet targeted goals. **9.1.12.D.10:** Differentiate among various investment products and savings vehicles and how to use them most effectively. **9.2.12.C.1:** Review career goals and determine steps necessary for attainment. **9.2.12.C.4:** Analyze how economic conditions and social changes influence employment trends and future education.
Technology Standards	**8.1.12.A.4:** Construct a spreadsheet, enter data, and use mathematical or logical functions to manipulate data, generate charts and graphs, and interpret the results.
Interdisciplinary Connections	ENLGISH LANUGAGE ARTS WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

NJSLS Mathematical Practices – These practices are demonstrated throughout the curriculum.	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.
NJSLS Career Ready Practices – These practices are demonstrated throughout the curriculum	CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Differentiation/Accommodations/Modifications

Gifted and Talented	English Language Learners	Students with Disabilities	Students at Risk of School Failure
(content, process, product and learning environment) **Extension Activities:** • Conduct research and provide presentation of mathematical topics. • Design surveys to generate and analyze data to be used in discussion. • Use of higher level questioning techniques. • Provide assessments at a higher level of thinking.	**Modifications for Classroom:** **Modifications for Homework/Assignments** • Modified assignments. • Extended time for assignment completion as needed. • Use graphing calculator. • Highlight formulas.	*(appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team)* **Modifications for Classroom:** • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide regular parent / school communication • Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments	**Modifications for Classroom:** • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments • Provide regular parent / school communication. • Assign peer helper in the class setting. • Provide oral reminders and check student work during independent work time.

		Modifications for Homework • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. **Modification for Assessments** • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments.	• Assist student with long and short term planning of assignments **Modifications for Homework** • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. **Modification for Assessments** • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments.

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<table>
<tr><td colspan="4">CONTENT: Mathematics</td></tr>
<tr><td colspan="4">Theme: Understanding the SAT and Its Components</td></tr>
<tr><td colspan="2">Essential Questions:
How the SAT is formatted and timed?
How is the mathematics section of the SAT scored?
How can materials be best utilized in order to increase scores?</td><td colspan="2">When should the student guess?
When should the student skip a question?
What strategies can the student use to answer questions?</td></tr>
<tr><td>Content (As a result of this learning segment, students will know…)

• The format and timing of the SAT. The scoring of the Mathematics section of the SAT.
• Strategies to best utilize materials in order to increase their scores.
• When to guess or skip a question. Strategies available to answer SAT questions.
• Common SAT misconceptions.
• Math questions are arranged by order of difficulty.
• All figures are drawn to scale unless otherwise indicated.
• When to use the calculator to solve a problem.</td><td>Skills (As a result of this learning segment, students will be able to…)

• Use Diagnostic testing to better understand baseline scores and determine improvement plans.
• Use strategies to answer SAT questions.
• Determine when to answer a question as an educated guess or to skip it.
• Use time appropriately to maximize scores.
• Set a personal goal.</td><td>Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

Classwork
Question of the Day Class Discussions Do-Now Activities
Homework
Quizzes
Homework
SAT Diagnostic Test
SAT Practice Test
Quizzes
Tests
Midterm Exam – Practice
SAT Final Exam – Practice
SAT

*Scores must improve by midterm exam and then again by final exam. Grade will depend on score improvement.</td><td>Standards:
NJSLS MA 9-12
Number and Quantity
Functions / Algebra
Geometry / Modeling

Time Frame:
Course is taught on a biweekly basis. Skills are practiced and reinforced on a continuous basis.

Materials:
Kaplan SAT 2015 Strategies, Practices, & Review
Kaplan The New SAT Math Workbook
College Board Question of the Day</td></tr>
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CONTENT: Mathematics

Theme: Numbers and Operations for the SAT

Essential Questions:
How is an understanding of rational numbers, their representations, and relationships useful in problem solving? What is a ratio and a proportion and how can they be used to find various relationships?
What are the mental computations necessary to work with real

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** NJSLS MA 9-12 N.RN.1, N.RN.3, N.Q.1, A.APR.1 TECH 8.1.12.A.4
• Vocabulary such as rational number, irrational number, real number, imaginary number, integer, natural number, whole number, factor, multiple, consecutive • The divisible rules for 2, 3, 4, 5, 9, 10 The percent formula, the percent increase and decrease formula. • The formula connecting distance, rate and time	• Find sums, differences, products and quotients for signed numbers, fractions and decimals. • Use the order of operation, number properties and scientific notation. • Convert mixed numbers and improper fractions. • Set up ratios. • Solve proportions. • Find rates and average rate. • Understand and apply the difference between percent and percent increase or decrease.	Classwork Question of the Day Class Discussions Do-Now Activities Homework Quizzes Homework SAT Diagnostic Test SAT Practice Test Quizzes Tests Midterm Exam – Practice SAT Final Exam – Practice SAT *Scores must improve by midterm exam and then again by final exam. Grade will depend on score improvement.	**Time Frame:** Course is taught on a biweekly basis. Skills are practiced and reinforced on a continuous basis. **Materials**: Kaplan SAT 2015 Strategies, Practices, & Review Kaplan The New SAT Math Workbook College Board Question of the Day Scientific or graphing calculator

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CONTENT: Mathematics

Theme: Algebra and Functions for the SAT

Essential Questions:
How can mathematical properties and identities be used to solve mathematical equations and inequalities? What mathematical operations represent their English counterparts?
How does vertical and horizontal movement and a scalar multiple affect the parent function? How can you simplify and solve expressions involving exponents?

What are the different methods that can be used to add, subtract, multiple and divide monomials and polynomials?
In what ways do relations, functions, graphs of functions and their inverses help us interpret real-world events or solve problems?

Content *(As a result of this learning segment, students will know…)*

- Vocabulary, such as domain, range, maximum, minimum, vertex, inverse
- Exponent rules
- When it is possible to add and subtract radicals
- Different ways to solve equations and inequalities
- Function notation
- Graphs of different functions
- The English representation of mathematical operations

Skills *(As a result of this learning segment, students will be able to…)*

- Solve problems involving positive, negative and rational exponents
- Simplify, add, subtract, multiply and divide radicals, monomials, binomials, trinomials and polynomials.
- Factor binomials, trinomials and polynomials.
- Simplify and evaluate Algebraic Expression
- Solve absolute value, rational, linear, quadratic, and system of equations and inequalities
- Rewrite equations "In terms of" another variable
- Understand function notation and evaluation
- Understand transformations of functions
- Identify domain and range of a function
- Solve direct and inverse variation

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

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Question of the Day
Class Discussions
Do-Now Activities
Homework Quizzes
Homework
SAT Diagnostic Test
SAT Practice Test
Quizzes
Tests
Midterm Exam – Practice SAT
Final Exam – Practice SAT

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Standards:
NJSLS MA 9-12
A.SSE.1, A.SSE.2, A.SSE.3,
A .CED.1, A.CED.2, A.CED.3,
A.CED.4, A.APR.1, A.APR.3,
A.REI.1, A.REI.2, A.REI.3, A.REI.4,
A.REI.5, A.REI.6, A.REI, 7,
A.REI.10, A.REI.11, A.REI.12
F.IF.1-9 F.BF.1-4
F.LE.1, F.LE.2, F.LE.3, N.RN.1, N.RN.2
TECH 8.1.12.A.4

Time Frame:
Course is taught on a biweekly basis. Skills are practiced and reinforced on a continuous basis.

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Kaplan The New SAT Math Workbook
College Board Question of the Day
Scientific or graphing calculator

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CONTENT: Mathematics

Theme: Geometry and Measurement for the SAT

Essential Questions:
What are the basic figures of Geometry?
What are the properties of the various quadrilaterals?
How can the Pythagorean Theorem and special right triangles be used to find the missing sides?
How do you calculate the area and perimeter of polygons and circles?
How do you calculate the surface area, volume, and other measures of a solid?
What are the properties and relationships that exist amongst triangles?

Content *(As a result of this learning segment, students will know…)*

- Geometric vocabulary, postulates and theorems
- Special right triangles, Pythagorean theorem and Triangle Inequality Theorem
- Area, perimeter, surface area and volume formulas
- Different types of angles and triangles and their associated theorems
- Properties of parallelograms, rectangles, rhombuses, squares and trapezoids.
- Interior and exterior angles of a polygon formulas
- Tangency Theorems

Skills *(As a result of this learning segment, students will be able to…)*

- Use theorems related to segments, angles, parallel and perpendicular lines, polygons and circles.
- Decide when to use Pythagorean Theorem versus special right triangles theorems.
- Find the area and perimeter (circumference) of polygons and circles.
- Find the surface area and volume of solids.
- Find the arc length and area of sector.
- Find the distance, slope and midpoint.
- Use an equation to find the slope and an intercept.

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

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Standards:
NJSLS MA 9-12
G.CO.1, G.CO.2, G.SRT.2, G.SRT.5, G.SRT. 8, G.C.2, G.GPE.5, G.GPE.7, G.GMD.3, G.GMD.4
TECH 8.1.12.A.4

Time Frame:
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CONTENT: Mathematics

Theme: Statistics, Probability, and Data Analysis for the SAT

Essential Questions:
How can experimental and theoretical probabilities be used to make predictions or draw conclusions?
How can you make and interpret different representations of data?
What is the difference between permutations and combinations?
How can the counting principle be used to predict outcomes?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards** NJSLS MA 9-12 N.Q.1, S.ID.3, S.ID.5, S.ID.6, S.CP.6, S.CP.7, S.CP.9 TECH 8.1.12.A.4 **Time Frame:** Course is taught on a biweekly basis. Skills are practiced and reinforced on a continuous basis. **Materials**: Kaplan SAT 2015 Strategies, Practices, & Review Kaplan The New SAT Math Workbook College Board Question of the Day Scientific or graphing calculator
• The definition of arithmetic mean (average), median, mode • Graphs are a visual representation of data. • The different types of graphs. Terminology associated with graphs, such as vertex, y-axis, or peak. • When to use combinations or permutations.	• Use average to find the sum. • Use average of evenly spaced numbers. • Find the mean, median and mode of data. • Interpret graphs, tables and charts. • Identify extraneous data from important information on graphs and tables. • Use the counting principle and probability to solve problems. • Solve problems involving combinations and permutations.	Classwork Questions of the Day Class Discussions Do-Now Activities Homework Quizzes Homework SAT Diagnostic Test SAT Practice Test Quizzes Tests Midterm Exam – Practice SAT Final Exam – Practice SAT *Scores must improve by midterm exam and then again by final exam. Grade will depend on score improvement.	